

This listing of claims will replace all prior versions and listings of claims in the application:

Cancel claims 4, 5, 18, 19 and 25 without prejudice.

Amend claims 1, 15 and 24.

Listing of Claims:

1. (currently amended) A system for separating particles from a contaminated liquid stream by flotation, comprising:

an apparatus for mixing the liquid with a separation enhancement additive and a gas, wherein the mixing apparatus comprises a reactor head having a gas injection port and a plurality of liquid ports configured to impart a spinning motion to the liquid as it passes to a downtube of the mixing apparatus, and wherein the liquid ports are configured to removably receive liquid flow restrictors, wherein the velocity and volume of the liquid passing through the mixing apparatus can be altered;

a pressure reducing device in fluid communication with an outlet of the mixing apparatus for creating bubble laden floccs in the liquid;

a flotation tank having a bloom chamber and a separation chamber, the bloom chamber in fluid communication with an outlet of the pressure reducing device, the flotation tank being configured to direct the bubble laden floccs upwardly within the bloom chamber to an upper portion of the flotation tank and circulate the bubble laden floccs within the upper portion of the flotation tank until they rise to an upper surface of the flotation tank, and wherein the decontaminated liquid flows to a lower portion of the separation chamber of the flotation tank; and

a mechanism for removing the floated contaminate floccs from the upper surface of the flotation tank.

2. (original) The system of claim 1, including a pressure sensor operably disposed between the mixing apparatus and the pressure reducing device.

3. (original) The system of claim 2, including an adjustable valve disposed between the mixing apparatus and the pressure reducing device for altering the flow of liquid to the pressure reducing device.

4. Canceled

5. Canceled

6. (original) The system of claim 1, wherein the pressure reducing device comprises an enlarged tube having a flow restrictor element therein.

7. (original) The system of claim 6, wherein the flow restrictor element comprises an apertured plate.

8. (original) The system of claim 7, wherein the size and the number of apertures in the plate are selected according to a predetermination of characteristics of the contaminated liquid.

9. (original) The system of claim 1, including an adjustable wall disposed between the bloom chamber and separation chamber of the flotation tank.

10. (original) The system of claim 1, including an apertured wall disposed within the separation chamber of the flotation tank above a floor thereof.

11. (original) The system of claim 1, including a decontaminated liquid outlet formed in a lower portion of the flotation tank.

12. (original) The system of claim 11, including a decontaminated liquid chamber in fluid communication with the lower portion of the flotation tank and the decontaminated liquid outlet and including an

adjustable wall for selectively controlling the volume of decontaminated liquid removed through the outlet.

13. (original) The system of claim 1, wherein the removing mechanism comprises a skimmer.

14. (original) The system of claim 1, including a dewatering apparatus disposed relative to the flotation tank to receive and dewater removed contaminated floccs.

15. (currently amended) A system for separating particles from a contaminated liquid stream by flotation, comprising:

an apparatus for mixing the liquid with a separation enhancement additive and a gas, wherein the mixing apparatus comprises a reactor head having a gas injection port and a plurality of liquid ports configured to impart a spinning motion to the liquid as it passes to a downtube of the mixing apparatus, and wherein the liquid ports are configured to removably receive liquid flow restrictors, wherein the velocity and volume of the liquid passing through the mixing apparatus can be altered;

a pressure reducing device comprising an enlarged tube having a flow restrictor element therein, the device being in fluid communication with an outlet of the mixing apparatus for creating bubble laden floccs in the liquid;

a flotation tank having a bloom chamber and a separation chamber, the bloom chamber in fluid communication with an outlet of the pressure reducing device, the flotation tank being configured to direct the bubble laden floccs upwardly within the bloom chamber to an upper portion of the flotation tank and circulate the bubble laden floccs within the upper portion of the flotation tank until they rise to an upper surface of the flotation tank, and wherein the decontaminated liquid flows to a lower portion of the separation chamber of the flotation tank;

a decontaminated liquid outlet formed in a lower portion of the separation chamber;

a skimmer for removing the floated contaminate floccs from the upper surface of the flotation tank; and

a dewatering apparatus disposed relative to the flotation tank to receive the floated contaminate floccs from the skimmer and configured to dewater the removed contaminated floccs.

16. (original) The system of claim 15, including a pressure sensor operably disposed between the mixing apparatus and the pressure reducing device.

17. (original) The system of claim 16, including an adjustable valve disposed between the mixing apparatus and the pressure reducing device for altering the flow of liquid to the pressure reducing device.

18. Canceled.

19. Canceled.

20. (original) The system of claim 15, wherein the flow restrictor element comprises an apertured plate, the size and the number of apertures in the plate being selected according to a predetermination of characteristics of the contaminated liquid.

21. (original) The system of claim 15, including an adjustable wall disposed between the bloom chamber and separation chamber of the flotation tank.

22. (original) The system of claim 15, including an apertured wall disposed within the separation chamber of the flotation tank above a floor thereof.

23. (original) The system of claim 15, including a decontaminated liquid chamber in fluid communication with the lower portion of the

flotation tank and the decontaminated liquid outlet and including an adjustable wall for selectively controlling the volume of decontaminated liquid removed through the outlet.

24. (currently amended) A system for separating particles from a contaminated liquid stream by flotation, comprising:

an apparatus for mixing the liquid with a separation enhancement additive and a gas, wherein the mixing apparatus comprises a reactor head having a gas injection port and a plurality of liquid ports configured to impart a spinning motion to the liquid as it passes to a downtube of the mixing apparatus, and wherein the liquid ports are configured to removably receive liquid flow restrictors, wherein the velocity and volume of the liquid passing through the mixing apparatus can be altered;

a pressure reducing device in fluid communication with an outlet of the mixing apparatus for creating bubble laden floccs in the liquid, the device comprising an enlarged tube having an apertured plate therein, the size and number of the apertures in the plate selected according to a predetermination of characteristics of the contaminated liquid;

a pressure sensor operably disposed between the pressure reducing device and the mixing apparatus;

an adjustable valve disposed between the pressure reducing device of the mixing apparatus for altering the flow of liquid to the pressure reducing device;

a flotation tank having a bloom chamber and a separation chamber separated by an adjustable wall, the bloom chamber in fluid communication with an outlet of the pressure reducing device, the flotation tank being configured to direct the bubble laden floccs upwardly within the bloom chamber to an upper portion of the flotation tank and circulate the bubble laden floccs within the upper portion of the flotation tank until they rise to an upper surface of the flotation tank, and wherein the decontaminated liquid flows to a lower portion of the separation chamber of the flotation tank;

a decontaminated liquid outlet formed in a lower portion of the separation chamber;

a skimmer for removing the floated contaminate floccs from the upper surface of the flotation tank; and

a dewatering apparatus disposed relative to the flotation tank to receive the floated contaminate floccs from the skimmer and configured to dewater the removed contaminated floccs.

25. Canceled.

26. (original) The system of claim 24, including an apertured wall disposed within the separation chamber of the flotation tank above a floor thereof.

27. (original) The system of claim 24, including a decontaminated liquid chamber in fluid communication with the lower portion of the flotation tank and the decontaminated liquid outlet and including an adjustable wall for selectively controlling the volume of decontaminated liquid removed through the outlet.

28. - 47. Canceled.